ACC020B12DC

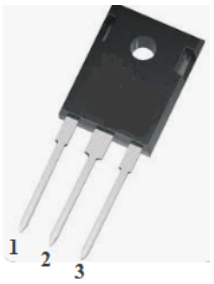
1200V / 20A SiC Schottky Barrier Diode

ACTRON TECHNOLOGY CORP.

Features

- Shorter recovery time
- High speed switching
- High surge current capability
- Enabling higher frequency and increased power density
- System efficiency improvement
- System cost and size savings due to the reduced cooling requirements

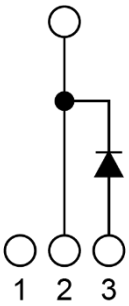
Outline (TO247-3L)



Applications

- Power Factor Correction in SMPS
- Solar inverter
- Uninterruptible Power Supply
- Motor Drives
- Data Center

Circuit Diagram



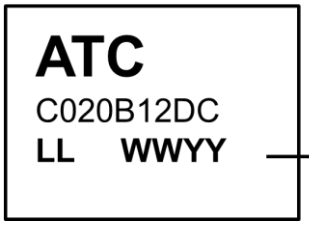
1: NC
2: Cathode
3: Anode

Mechanical Characteristics

- TO247-3L package
- Halogen Free
- Pb free lead plating ; RoHS compliant
- Packaging: Tube

Marking Diagram

Laser Mark



L L : Assembly Lot code
WW : Week
YY : Year

Parameter and Specification

Absolute Maximum Rating(1)

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	V_{RM}	Tc=25℃	1200	V
Continue forward current	I_F	Tc=135℃	20	A
Surge non-repetitive forward current , sine half-wave	I_{FSM}	Tc=25℃, tp=10ms, Sine half wave	216	A
		Tc=110℃, tp=10ms, Sine half wave	162	
Surge repetitive forward current	I_{FRM}	Tc=25℃, tp=10ms, Sine half wave	97	A
I^2t value	$\int I^2t$	Tc=25℃, tp=10ms, Sine half wave	233	A^2s
Total power dissipation	P_D	Tc=25℃	144	W
		Tc=110℃	46	
Junction temperature	T_j		175	℃
Storage temperature	T_{STG}		-55 ~ 175	℃

Note :

(1) Exceeding these ratings may damage the device.

Thermal Characteristics

Parameter	Symbol	Condition	Typ.	Unit
Thermal resistance	θjc	Junction - Case	0.69	℃ / W

Electrical Characteristics

Characteristic	Symbol	Condition	MIN	TYP	MAX	Unit
DC reverse voltage	V_{DC}	T_j = 25℃, I_R = 100μA	1200	-	-	V
Forward voltage	V_F	T_j = 25℃, I_F = 20A	-	1.4	1.6	V
		T_j = 150℃, I_F = 20A	-	1.8	-	
		T_j = 175℃, I_F = 20A	-	1.9	-	
Reverse current	I_R	T_j = 25℃, V_R = 1200V	-	10	100	uA
		T_j = 150℃, V_R = 1200V	-	40	-	
		T_j = 175℃, V_R = 1200V	-	75	-	
Total capacity charge	Q_C	T_j = 25℃, V_R = 800V, $Qc=\int_0^{V_R} C(V)dV$	-	116	-	nC
Total capacitance	C_{TOT}	T_j = 25℃, V_R = 1V, F = 1MHz	-	1430	-	pF
		T_j = 25℃, V_R = 800V, F = 1MHz	-	85	-	
		T_j = 25℃, V_R = 1200V, F = 1MHz	-	83	-	
Capacitance Stored Energy	E_C	V_R = 800V	-	35	-	μJ

Electrical Characteristic Curves

V_F – I_F Characteristics

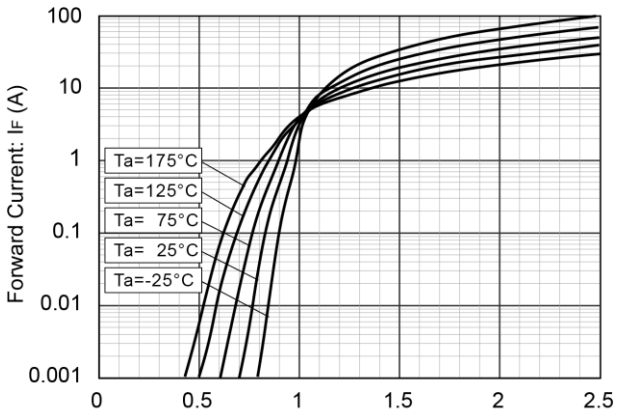


Figure1. Forward Voltage: V_F (V)

V_F – I_F Characteristics

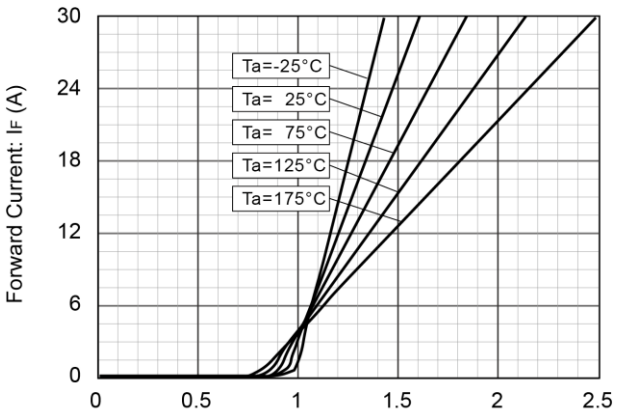


Figure2. Forward Voltage: V_F (V)

V_R – I_R Characteristics

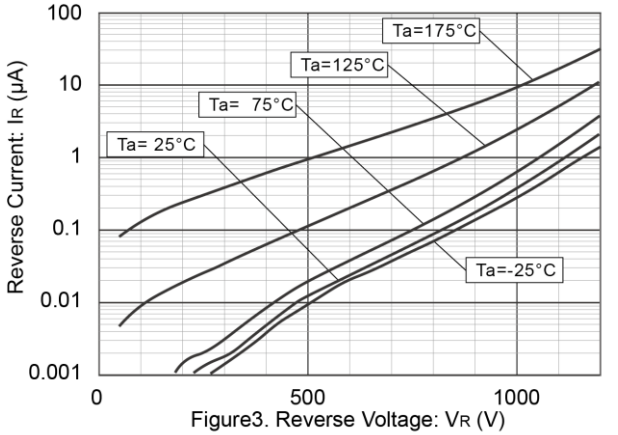


Figure3. Reverse Voltage: V_R (V)

V_R – C_t Characteristics

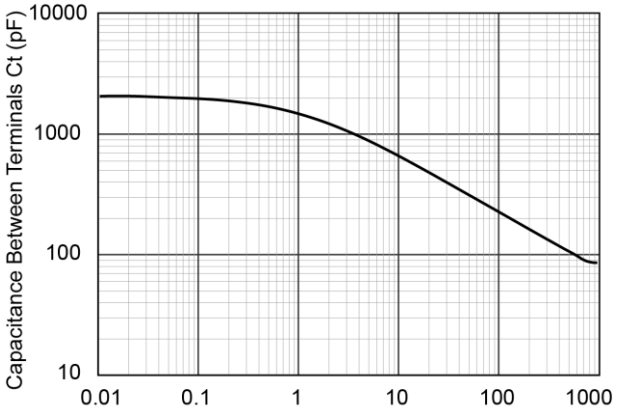


Figure4. Reverse Voltage: V_R(V) Ta = 25 °C f = 1MHz

Maximum I_P –T_C Characteristics

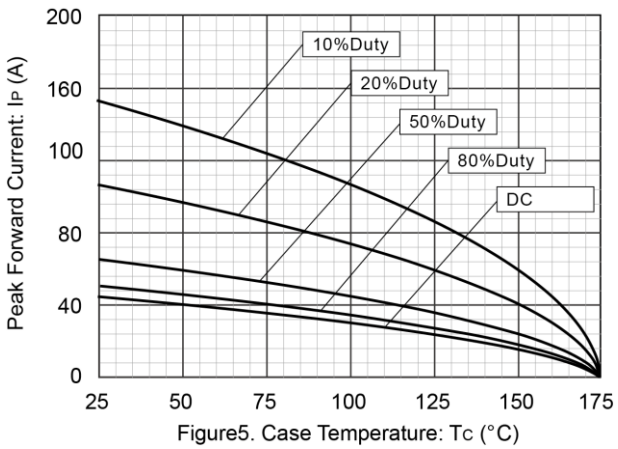


Figure5. Case Temperature: T_C (°C)

Power Dissipation

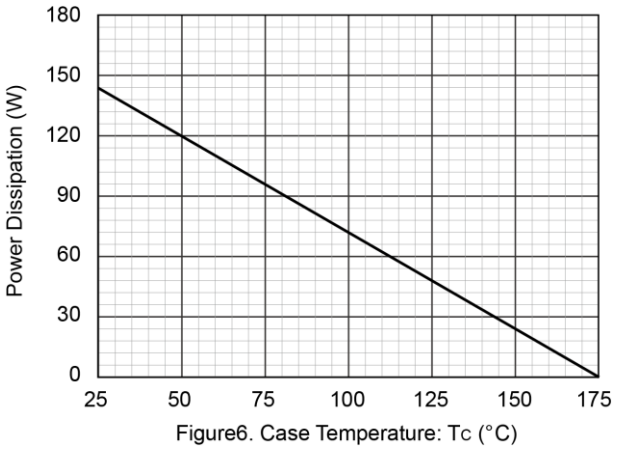


Figure6. Case Temperature: T_C (°C)

I_{FSM} – PW Characteristics

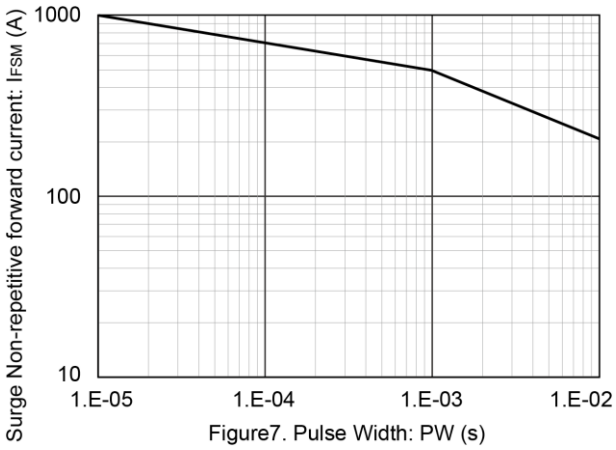


Figure7. Pulse Width: PW (s)

E_C – V_R Characteristics

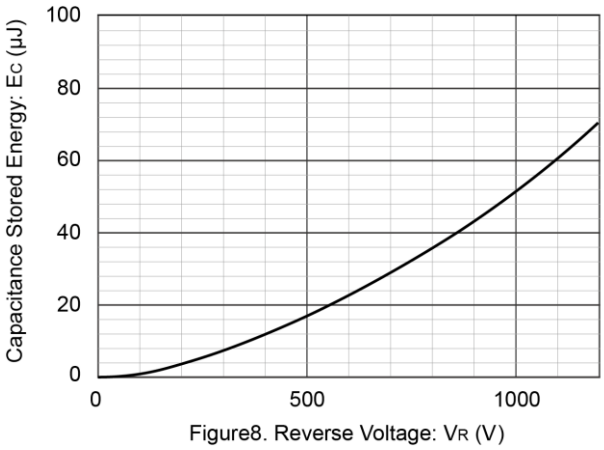


Figure8. Reverse Voltage: VR (V)

Typical Transient Thermal Resistance vs. Pulse Width

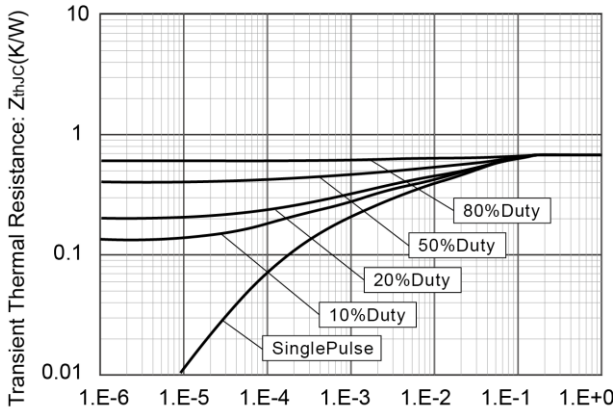
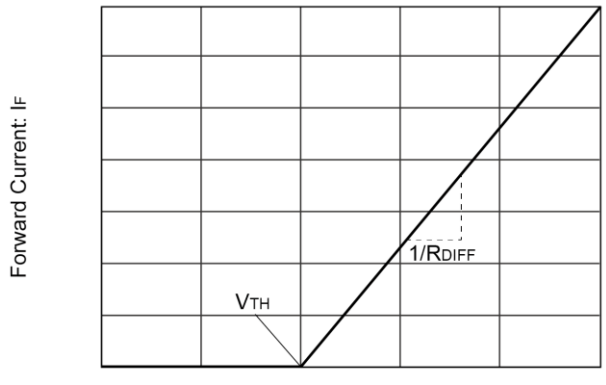


Figure9. Pulse Width: PW(S)

Simplified Forward Characteristic



Forward Voltage: VF

Figure10. Equivalent forward current curve

$$V_F=V_{TH}+R_{DIFF}\times I_F$$

Threshold Voltage(V_{TH}):

$$V_{TH}(T_j)=-0.001\times T_j+0.953\text{[V]}$$

Differential Resistance(R_{DIFF}):

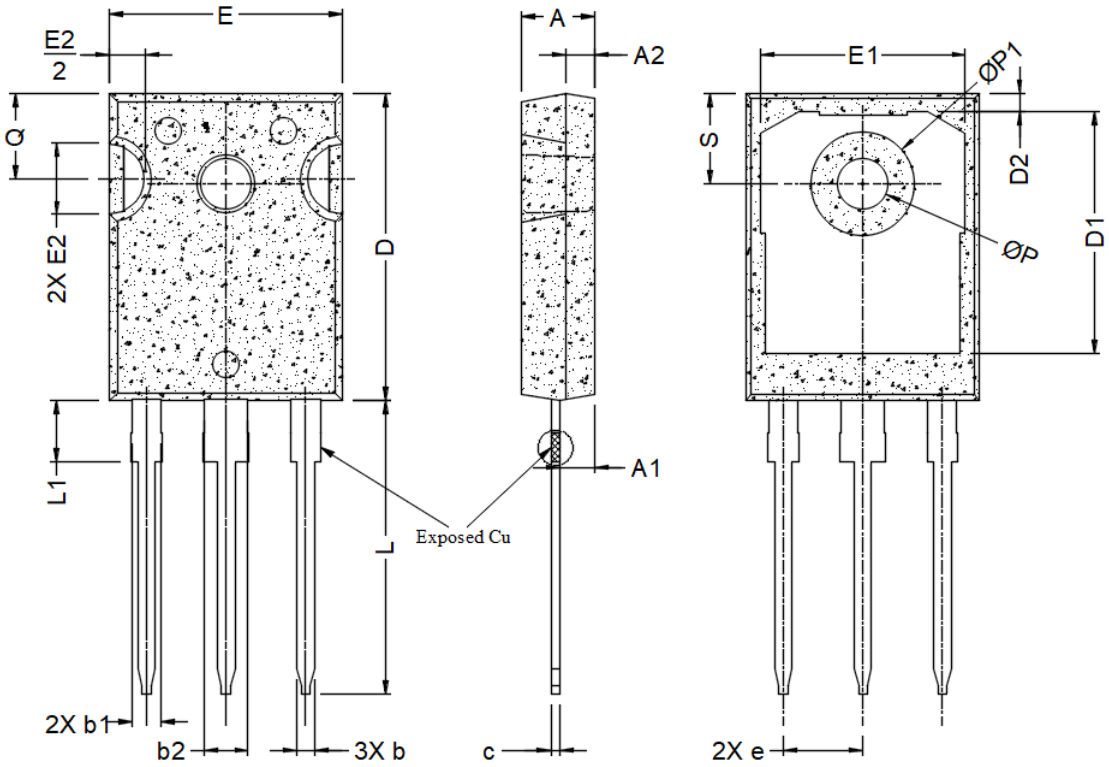
$$R_{DIFF}(T_j)=A\times T_j^2+B\times T_j+C[\Omega]$$

$$A=4.0\times10^{-7}$$

$$B=1.5\times10^{-4}$$

$$C=1.85\times10^{-2}$$

Package Outline



Unit : mm

SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.83	5.02	5.21
A1	2.29	2.41	2.55
A2	1.50	2.00	2.49
b	1.12	1.20	1.33
b1	1.91	2.00	2.39
b2	2.87	3.00	3.22
c	0.55	0.60	0.69
D	20.80	20.95	21.10
D1	16.25	16.55	17.65
D2	0.51	1.19	1.35
E	15.75	15.94	16.13
E1	13.46	14.02	14.16
E2	4.32	4.91	5.49
e	5.44BSC		
L	19.81	20.07	20.32
L1	4.10	4.19	4.40
ØP	3.56	3.61	3.65
ØP1	7.19REF.		
Q	5.39	5.79	6.20
S	6.04	6.17	6.30